

Issuance Date: September 28, 2012
Pre-Bi Meeting: October 1, 2012
Bid Opening Date: October 3, 2012
BMA Approval Date: October 22, 2012

**CITY OF GERMANTOWN
INVITATION TO BID
ELECTRICAL SPECIFICATIONS FOR DISTRIBUTION CENTERS
FOR RADIO SHELTER BUILDINGS**



**1930 S. Germantown Road
Germantown, TN 38138**



CITY OF GERMANTOWN TENNESSEE

1930 South Germantown Road • Germantown, Tennessee 38138-2815
Phone (901) 757-7200 Fax (901) 757-7292 www.germantown-tn.gov

REQUEST FOR BIDS

Date: September 28, 2012

The City of Germantown, Tennessee, will accept Bids on:

ELECTRICAL SPECIFICATIONS FOR DISTRIBUTION CENTERS FOR RADIO SHELTER BUILDINGS

Bid shall be mailed in a **sealed envelope** marked “” in the lower left-hand corner of the envelope and addressed to Purchasing Officer, City of Germantown, P. O. Box 38809, Germantown, TN 38183-0809 or, **if using express mail** (Fed Ex, Priority Mail, etc), address to 1930 S. Germantown Rd., Germantown, TN 38138. Please place in a sealed envelope inside the express mail packaging. (*Bid must be received by the City prior to the time indicated below.*) **Please mark envelope with the name of the Bid.**

BID DATE: Bid shall be opened at 1930 S. Germantown Rd at 2:00 p.m. on October 3, 2012.

Mandatory Pre-Bid Meeting will be at 2pm on October 1, 2012 at the Municipal Center at 1930 S. Germantown Road.

The City reserves the right to accept or reject any Bid, to accept a Bid containing variations from these specifications if the Bid so merits, and to accept partial Bids. *Bids must be submitted on the Bid document that the City issues and it must be signed.*

The Successful Bidder shall be prohibited from discriminating against any individual due to his race, creed, color, national origin, age or sex.

The City may waive any informalities or minor irregularities. The Board of Mayor and Aldermen is the final authority and shall have the right to reject any single Bid or all Bids submitted.

See attached Specifications, Bid Sheet, Drug and Alcohol Testing Acknowledgment Statement and Affidavit along with Company's Testing Policy, and Vendor's Qualifications and Reference Form that must be returned as part of the Bid. Returning the form for disclosure of the Title VI and Title IX information is voluntary.

The Standard Germantown Terms & Conditions and Insurance Certifications are included and will be required from the selected Bidder.

Sincerely,

Lisa A. Piefer

Lisa A. Piefer
Purchasing Officer

**ELECTRICAL SPECIFICATIONS FOR DISTRIBUTION CENTERS
FOR RADIO SHELTER BUILDINGS
GENERAL INFORMATION & SPECIFICATIONS INFORMATION**

SCOPE:

The scope of this turnkey project is to provide all necessary permits, labor machinery, tools, apparatus, equipment, parts, and any other necessary supplies to install electrical distribution for two radio tower buildings.

Radio tower sites are within Morgan Woods Park and Johnson Road Park. Completion of each site is time sensitive and must be completed by October 15, 2012. This completion date is to allow the radio service provider to begin their project, which is to be completed by December 31, 2012. The following information is listed in the back of this document.

CONSTRUCTION DRAWINGS:

Cover Sheet

Electrical Site Plan E1.0

SPECIFICATIONS:

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GENERAL INFORMATION:

The City has provided its standard Terms and Conditions for you to review and will require Insurance Certificates and Drug and Alcohol Testing Acknowledgment Statement and Affidavit along with Company's Testing Policy.

The City may waive any informalities or minor irregularities. The Board of Mayor and Aldermen is the final authority and shall have the right to reject any single Bid or all Bids submitted.

**CITY OF GERMANTOWN
BID SHEET**

Bid of:

(Name of Bidder)

(Address of Bidder)

organized and existing under the laws of the State of _____ and doing business as _____ (indicate: "a corporation", "a partnership", "an individual", a "limited liability company" or otherwise, as applicable).

To: City of Germantown - Owner
 City Purchasing Officer
 1930 South Germantown Road
 Germantown, Tennessee 38138

In compliance with your ADVERTISEMENT FOR BIDS, BIDDER hereby proposes to furnish all necessary labor, machinery, tools, apparatus, materials, equipment, services, and other necessary supplies in strict accordance with the terms and conditions of the plans, specifications and CONTRACT DOCUMENTS within the number of consecutive calendar days and at the prices set forth below for the construction of:

**Project: ELECTRICAL SPECIFICATIONS FOR DISTRIBUTION CENTERS
 FOR RADIO SHELTER BUILDINGS**

By submitting this BID, BIDDER certifies that this BID has been arrived at independently without consultation, communication or agreement as to any matter relating to this BID with any other BIDDER or with any other competitor.

BIDDER agrees, upon receipt of the NOTICE OF AWARD accompanied by the Terms & Conditions and all required attachments, to cause same to be properly executed and returned to the CITY OF GERMANTOWN within fifteen (15) days thereafter. BIDDER further agrees, upon receipt of the NOTICE TO PROCEED, (i) to commence work on the PROJECT not later than the last date stated in the Notice to Proceed as to which the BIDDER may commence to proceed, and (ii) to complete the PROJECT by October 15, 2012.

BIDDER agrees to perform all work described in the CONTRACT DOCUMENTS for the following unit price or lump sum:

BID FORM

Item	Description	Unit	Total Price
1	Morgan Woods Radio Tower Building - The scope of this turnkey project is to provide all necessary permits, labor machinery, tools, apparatus, equipment, parts, and any other necessary supplies to install electrical distribution for Morgan Woods radio tower building	LS	
2	Johnson Road Radio Tower Building - The scope of this turnkey project is to provide all necessary permits, labor machinery, tools, apparatus, equipment, parts, and any other necessary supplies to install electrical distribution for Johnson Road tower building	LS	
		Total Bid	

TOTAL BID PRICE, IN WORDS:

_____ DOLLARS AND _____ CENTS (\$_____ . ____)

Submitted By:

(Name of Bidder)

By: _____

Title: _____

Address: _____

Telephone No.: _____

Fax No.: _____

(Date Bid Submitted)

License Number

Date of Expiration of License

CITY OF GERMANTOWN DRUG AND ALCOHOL TESTING POLICY

All City of Germantown employees are subject to reasonable suspicion drug and alcohol testing. Employees in safety-sensitive positions, including, without limitation, police, fire and those who hold a commercial driver's license, are subject to pre-employment, reasonable suspicion, post-accident and random drug and alcohol testing. All BIDDERS are required to submit an affidavit, in the form attached hereto, that attests that such bidder operates a drug-free workplace program or other drug or alcohol testing program with requirements at least as stringent as that of the program operated by the City of Germantown. BIDDERS are hereby notified pursuant to Public Chapter 693 of the Public Acts of 2002 (codified as T.C.A. Section 50-9-114) that employers shall have seven (7) calendar days from the date that the successful BIDDER and the City of Germantown enter into the Contract & Agreement to file suit in the Shelby County Chancery Court to contest the Contract & Agreement issued to the successful BIDDER on the grounds that it violates said Public Chapter due to the fact that the successful BIDDER did not comply with said Public Chapter. Employers that do not contest the Contract & Agreement within said seven (7) calendar days by filing suit in Shelby County Chancery Court shall waive their rights to challenge the Contract & Agreement for violation of the provisions of Public Chapter 693.

DRUG AND ALCOHOL ABUSE

GENERAL POLICY

This is to establish the City's policy regarding drug and alcohol use and the unlawful possession of controlled substances on City of Germantown premises. The City of Germantown Medical Benefits Program provides clinical treatment for employees and dependents who are experiencing the following disorders or conditions: Mental and Nervous Disorders Treatment, Alcohol and Drug Dependency. The City also provides an Employee Assistance Program.

SCOPE

All employees of the City of Germantown.

PROVISIONS

- A. City employees shall not take or be under the influence of any alcohol or illegal drugs while on duty. Employees may not be under the influence of legally prescribed or over-the-counter medications while on duty if such medications would impair their ability to safely and effectively perform their job.
- B. City employees are prohibited from the use, possession, manufacture, distribution and sale of drugs at any time, or of alcohol while on duty or while in or on City property or in City vehicles.
- C. All property belonging to the City is subject to inspection at any time without notice. Property includes, but is not limited to, vehicles, desks, containers, files, and storage lockers.
- D. City employees who have reason to believe another employee is illegally using drugs or narcotics, shall report the facts and circumstances immediately to the supervisor.
- E. All City employees are subject to reasonable suspicion drug and alcohol testing. Employees in safety-sensitive positions, including without limitation, police, fire and those who hold a commercial driver's license, are subject to pre-employment, reasonable suspicion, post-accident and random drug and alcohol testing. Testing procedures and other rules relating to drug and alcohol abuse are described in the City Drug and Alcohol Testing Policy or the respective department drug and alcohol policies.
- F. Failure to comply with the intent or provisions of this policy or the applicable drug and alcohol testing policy may be used as grounds for disciplinary action, up to and including termination. (See Policy on Disciplinary Action.)

**DRUG AND ALCOHOL TESTING ACKNOWLEDGMENT
STATEMENT AND AFFIDAVIT**

Comes _____, for and on behalf of
(*Printed name of Principal Officer of Company*)
_____, (the "Company") and makes oath that:

(i) the Company has received a copy of the relevant portions of the City of Germantown Drug and Alcohol Testing Policy; (ii) the Company understands that it must have a drug and alcohol testing policy at least as stringent as that of the City of Germantown; and (iii) the Company has in effect a drug and alcohol testing policy at least as stringent as that of the City of Germantown.

Signature

Title: _____

Sworn to and subscribed before me, a Notary Public, this _____ day of _____, 2012.

Notary Public

My Commission Expires:

TITLE VI INFORMATION

1. The City of Germantown agrees to comply with the Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d, et seq.), and the Department of Transportation Implementing Regulations (49 CFR Part 21) relative to the Contract which is the subject hereof.
2. The Contractor is requested, but is not obligated, to include the attached disclosure sheet, Voluntary Title VI and Title IX Form, with the Contractor's sealed bid.

VOLUNTARY TITLE VI AND TITLE IX FORM

Attach form to sealed bid

For Title VI and Title IX compliance, the Contractor's voluntary disclosure of the following information is requested.

1. Number of Contractor's Employees Who Are:

_____ Male

_____ Female

2. Number of Contractor's Employees Who Are:

_____ Caucasian

_____ African-American

_____ Other (please specify) _____

GERMANTOWN INSURANCE REQUIREMENT CITY PROJECT CONTRACT

The CONTRACTOR shall purchase and maintain such comprehensive general liability and other insurance as will provide protection from claims set forth below which may arise out of or result from the CONTRACTOR'S performance of the work and the CONTRACTOR'S other obligations under the Contract Documents, whether such performance is by the CONTRACTOR, by any Subcontractor, by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

1. Claims under workers' or workmen's compensation, disability benefits and other similar employee benefit acts;
2. Claims for damages because of bodily injury, occupational sickness or disease, or death of the CONTRACTOR'S employees;
3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than the CONTRACTOR'S employees;
4. Claims for damages which may be insured by personal injury liability coverage which are sustained (i) by any person as a result of an offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (ii) by any other person for any other reason;
5. Claims for damages, other than to the work itself, because of injury to or destruction of tangible property, including loss of use resulting there from;
6. Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle; and
7. Claims by third parties for bodily injury and property damage arising or resulting from the CONTRACTOR's failure to comply with any obligation undertaken by him pursuant to the Contract Documents.

The automobile general liability insurance required by this Contract shall include the specific coverage's and be written for not less than \$500,000 bodily injury and \$100,000 property damage.

The comprehensive general liability insurance required by this Contract shall include the specific coverage's and shall be written for not less than \$1 million combined per occurrence limit or \$3 million aggregate limit with the entire aggregate limits dedicated to this particular job.

The CONTRACTOR shall have and maintain during the life of the Contract and Agreement such Property Insurance upon his entire work at the site to the full insurable value thereof. This insurance shall protect the City of Germantown, as its interest may appear in the work, and shall

insure against the perils of fire and extended coverage and shall include “all risk” insurance for the physical loss or damage including, without duplication of coverage, theft, vandalism and malicious mischief.

All such insurance shall be set out on the Certificate of Insurance (form included for both occurrence and aggregate policy) executed by an insurance company or insurance companies authorized to do business in the State of Tennessee. The Certificate of Insurance shall contain the following provision:

“Should any of the described policies on the attached Certificate of Insurance be cancelled, non-renewed or reduced in coverage – the issuing insurance company will mail 30 days prior written notice to: **The City of Germantown, Risk Management Department, P.O. Box 38809 Germantown, TN 38138-0809**, by registered mail, return receipt request.”

All such insurance shall remain in effect until final acceptance and at all times thereafter when the CONTRACTOR may be correcting, removing or replacing defective work in accordance with the Contract and Agreement.

The comprehensive general liability insurance required by this section will include contractual liability insurance applicable to the CONTRACTOR’S obligations under the Contract and Agreement.

CERTIFICATE OF INSURANCE					
PRODUCER Agency Address City State Zip			DATE 8/30/2004		
			THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.		
INSURED Insured Address City State Zip			COMPANIES AFFORDING COVERAGE		
			COMPANY LETTER A Company		
			COMPANY LETTER B		
			COMPANY LETTER C		
COVERAGES					
THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN. THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.					
CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY PERIOD	LIMITS	
A	GENERAL LIABILITY				
	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY			GENERAL AGGREGATE	\$ 1,000,000
	<input type="checkbox"/> CLAIMS MADE	Policy #	Date	PRODUCTS/COMPLETED OPER. AGGR.	\$ 1,000,000
	<input type="checkbox"/> PERSONAL INJURY LIABILITY		Date	PERSONAL & ADVERTISING INJURY	\$ 1,000,000
				EACH OCCURRENCE	\$ 1,000,000
				DAMAGE TO RENTED PREMISES	\$ 50,000
				MEDICAL EXPENSE (ANY ONE PERSON)	\$ 5,000
				PER OCCURRENCE	
A	AUTOMOBILE LIABILITY			TORT	
	<input checked="" type="checkbox"/> OWNED AUTOS	Policy #	Date	COMBINED SINGLE LIMIT	\$ 1,000,000
	<input checked="" type="checkbox"/> HIRED AUTOS		Date		
	<input checked="" type="checkbox"/> NON-OWNED AUTOS				
	<input type="checkbox"/> PHYSICAL DAMAGE				
A	WORKERS COMPENSATION AND EMPLOYERS LIABILITY			WC STATUTORY LIMITS	
		Policy #	Date	EL-EACH ACCIDENT	\$ 100,000
			Date	EL-DISEASE-POLICY LIMIT	\$ 500,000
				EL-DISEASE EACH EMPLOYEE	\$ 100,000
A	Umbrella			WC STATUTORY LIMITS	
		Policy #	Date	LIABILITY LIMIT EACH OCCURRENCE	\$ 2,000,000
			Date	LIABILITY AGGREGATE LIMIT	\$ 2,000,000
				REATTAINED LIMIT	\$ 10,000
	<input type="checkbox"/> SPECIAL				
	<input type="checkbox"/> EARTHQUAKE				
	<input type="checkbox"/> FLOOD				
A	BUILDERS RISK			LIMIT PER LOCATION	
	<input type="checkbox"/> PER PROJECT				
OTHER					
LOCATION OF PREMISES/DESCRIPTION OF PROPERTY/DESCRIPTION OF OPERATIONS/DESCRIPTION OF VEHICLES/SPECIAL ITEMS City of Germantown Named as Additional Insured per Endorsement 2010 (11/85)					
CERTIFICATE HOLDER			CANCELLATION		
City of Germantown C/O Risk Manager 1930 Germantown Road S Germantown, Tn. 38138			SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT,		
			AUTHORIZED REPRESENTATIVE		
			Producer		

CITY OF GERMANTOWN
Certificate of Insurance Attachment

Named Insured: _____

Project: _____

This is to certify that insurance policies listed on the attached certificate of insurance contain the following:

1. General Liability Insurance Includes:
 - Premises/Operations
 - Products/Completed Operations
 - Broad Form Property Damage
 - Blanket Contractual Coverage
 - X (Explosion), C (Collapse) and U (Underground) Coverage
 - Independent Contractors
2. The City of Germantown is named as an Additional Insured on the General Liability, using a CG 2010 (11/85) endorsement, for the referenced project and the City of Germantown is named additional insured on the Business Auto Coverage.
3. Insured agrees to “Waive its Right of Subrogation” against the City of Germantown relative to Workers Compensation, General Liability, and Auto.
4. Cancellation Clause is amended to read: Should any of the described policies on the attached Certificate of Insurance be cancelled, non-renewed or reduced in coverage – the issuing insurance company will mail 30 days prior written notice to: **The City of Germantown, Risk Management Department, P.O. Box 38809 Germantown, TN 38138-0809**, by registered mail, return receipt request.

Agency or Company: _____

Authorized Agency Representative: _____
(Signature)

Date Issued: _____



CITY OF GERMANTOWN
FINANCE & GENERAL SERVICES DEPARTMENT
Purchasing Division
1930 S. Germantown Road
Germantown, TN 38138
(901)757-7260 • FAX (901)757-7258
E-Mail: Purchasing@germantown-tn.gov
Website: www.germantown-tn.gov

Standard Terms & Conditions

The following terms and conditions (the "Terms and Conditions") shall apply to any and all purchase orders (the "PO") issued by the City of Germantown (the "COG").

ACCEPTANCE: Acceptance of this PO is expressly limited to the Terms and Conditions stated herein, and Vendor shall be bound thereby when it provides written acceptance of the PO or commences any performance hereunder.

ALTERATIONS OR AMENDMENTS: Additional or different terms proposed by Vendor shall not be applicable to the PO or the Terms and Conditions unless accepted in writing by a duly authorized representative of the COG. No change, modification or revision of this PO shall be valid unless in writing and signed by a duly authorized representative of the COG.

ASSIGNMENTS: Vendor shall not delegate or assign the PO or any part thereof without the prior written consent of the COG.

COMPLIANCE WITH APPLICABLE LAW: Vendor will fully observe and comply with all applicable federal, state and local laws and regulations governing the conduct of Vendor's business and the delivery of goods and/or services pursuant to the PO.

TAXES: The COG is exempt from paying Tennessee sales and use tax and federal excise tax. Price(s) must be exclusive of these taxes. Vendor shall pay all taxes, levies, duties and assessments of every nature which may be applicable to any goods and/or services delivered under the PO.

DELIVERY REQUIREMENTS: Unless otherwise stated on the PO, the delivery terms of any goods delivered to the COG under the PO shall be FOB DESTINATION, and title shall pass to the COG upon acceptance at the final delivery point. Prices shall include delivery as well as any necessary unloading and inside delivery. If delivery of the goods cannot be made as specified and at the price shown on the PO, Vendor must notify the COG immediately. Overshipments will not be accepted unless authorized by the COG in advance and in writing and, if unauthorized, will be returned to the Vendor at the Vendor's expense.

RIGHTS OF INSPECTION AND REJECTION: Final inspection of any goods delivered under the PO shall be made at the final delivery point. The COG shall have the right to reject any or

all items not in conformance with the PO and/or applicable specifications and Vendor shall be responsible for any and all costs associated with such rejection, including transportation and handling costs for the return of such goods. Acceptance of goods does not constitute a waiver of latent or hidden defects or defects not readily detectable by a reasonable person under the circumstances.

IDENTIFICATION: The PO number must appear on all invoices, packing slips, shipping notices, freight bills and correspondence concerning this PO. Packing lists indicating the contents of each package must accompany each shipment.

INVOICES: All invoices must reference the PO number and shall be sent to: City of Germantown, Accounts Payable, 1930 S. Germantown Road, Germantown, TN 38138. In addition to the PO number, invoices should include the following: Vendor name and address, data and number of invoice, delivery date, and any other information (e.g., quantity, description, period of performance) necessary to identify the goods and/or services for which the payment is requested. The COG will not be responsible for equipment, materials, services or supplies delivered or furnished to the COG without a valid PO.

PAYMENT: Standard terms for payment shall be NET 30 DAYS unless otherwise noted on the face of the PO. Payment discount period will be calculated from the date of receipt of a complete, current invoice or receipt and acceptance of goods and/or services, whichever is later. Payments shall be made by the COG upon satisfactory delivery and acceptance of all goods and/or services to be delivered by Vendor under the PO and submission of a proper invoice containing the required information set forth above. Each PO shall be covered by separate invoice.

WARRANTIES: For a period of one year from the date of final acceptance by the COG of the goods and/or services provided pursuant to the PO, whether by Vendor or through a subcontractor, or for the period stated in the Vendor's/manufacture's standard warranty, whichever is longer, Vendor warrants that: (i) in the case of goods, all goods supplied under this PO will be merchantable and free from defects in material, workmanship and design; will conform to applicable specifications; will be fit for the purpose intended and free from liens and/or encumbrances of any nature; and (ii) in the case of services, all services supplied under this PO shall conform to all applicable standards of care and practice in effect at the time the service is performed; be of the highest quality; and be free from all faults, defects or errors. If any defect or faulty material is found, Vendor shall immediately, upon notification by the COG, proceed at Vendor's expense to replace or repair the same, together with any finishes, fixtures, equipment and furnishings that may be damaged as a result of the defect. Vendor shall use its best efforts to resolve the defect within five (5) days of written notification by the COG of the defect. Replaced and repaired goods shall be warranted for the remainder of the warranty period. The warranties contained herein shall survive the termination or expiration of the PO and are in addition to any and all other warranties arising by law or agreement.

INDEMNIFICATION: The Vendor shall assume all risk in connection with the performance of the PO, and shall be liable for any damages to persons or property resulting from the negligent or willful acts, errors, or omissions of the Vendor, its agents, servants, and/or employees in connection with the delivery of the goods and/or services covered by the PO. The Vendor agrees that it will indemnify and hold the COG and its employees harmless from all claims of any type and for any expenses and costs including attorney's fees and court costs which may be incurred by the COG

arising from the negligent or willful acts, errors, or omissions of the Vendor, its agents, servants and/or employees in the performance of the PO, and the Vendor will carry sufficient general liability insurance to provide the above indemnification. The indemnities set forth herein shall survive the expiration or termination of the PO.

EQUAL EMPLOYMENT OPPORTUNITY: In the performance of the PO, the Vendor shall not discriminate against any employee or applicant for employment because of race, creed, color, national origin or sex. The Vendor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, national origin or sex. The Vendor agrees to post in conspicuous spaces available to employees and applicants for employment a notice setting forth the provisions of the non-discrimination clause contained hereinabove. The Vendor shall, in all solicitations or advertisements for employees placed by, or on behalf of, the Vendor, state that all qualified applicants shall receive consideration for employment without regard to race, creed, color, national origin or sex. The Vendor shall incorporate the foregoing requirements of this paragraph in all subcontracts, if any, for services or products covered by the PO.

OFFICIALS NOT TO BENEFIT: The Vendor declares that neither the Mayor, nor any Aldermen, nor any other COG official or employee holds a direct or indirect interest in the PO. The Vendor pledges that it will notify the COG in writing should any COG official become either directly or indirectly interested in the PO. The Vendor declares that as of the date of this declaration that it has not given or donated or promised to give or donate, either directly or indirectly, to any official or employee of the COG, or to pay anyone else for the benefit of any official or employee of the COG any sum of money or other thing of value for aid or assistance in obtaining the PO. The Vendor further pledges that neither it nor any of its owners, officers or employees will give or donate or promise to give or donate, directly or indirectly, to any official or employee of the Vendor or anyone else for the benefit thereof any sum of money or other thing of value with a view to securing a contract or securing favorable treatment with respect to an award or amendment to the PO or the making of any determination with respect to the performance of any contract.

SEVERABILITY: If any provision of the PO is declared illegal, void or unenforceable, the remaining provisions shall not be affected but shall remain in force and in effect.

GOVERNING LAW/VENUE: The PO shall be construed and enforced in accordance with the laws of the State of Tennessee. Any action at law or other judicial proceeding for the enforcement of any provision shall be instituted in a state court located in the County of Shelby, State of Tennessee.

TERMINATION: The COG may terminate this PO or any part thereof, with or without cause, by providing written notice to Vendor. Upon receipt of such notice, the Vendor shall immediately discontinue delivery of all goods and/or services under the PO (unless the notice directs otherwise). If the termination is due to the failure of the Vendor to fulfill its obligations under the PO, the COG may:

- 1) Require the Vendor to deliver any goods and/or services described in the notice of termination;
- 2) Take over and prosecute the same to completion by contract or otherwise, and the Vendor shall be liable for any additional cost incurred by the COG and/or

- 3) Withhold any payments to the Vendor for purpose of set-off or partial payments, as the case may be, of amounts owed by the COG to the Vendor.

The COG shall only be liable for payment for goods delivered and/or services rendered before the effective date of any termination. In the event funds are not appropriated by the COG for the goods and/or services to be provided under the PO or in the event insufficient funds exist to purchase the goods and/or services, then the PO shall expire upon the expenditure of previously appropriated funds or the end of the current fiscal year, whichever occurs first, with no further obligation owed to or by either party.

ELECTRICAL DISTRIBUTION CENTER UPGRADES
FOR

RADIO TOWER SHELTER BUILDINGS

FOR

CITY OF GERMANTOWN
1930 GERMANTOWN ROAD SOUTH
GERMANTOWN, TENNESSEE 38138

SEPTEMBER 14, 2012

DRAWING INDEX

GE1.0 - Electrical Site Plans



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DIVISION 16 – ELECTRICAL

SECTION 16010 – ELECTRICAL GENERAL PROVISIONS

PART 1 – GENERAL

1.01 REQUIREMENTS:

- A. The work under this section of the work is subject to the provisions of the General Provisions and Special Conditions all of which are hereby incorporated herein and by this reference made a part thereof.
- B. The Contractor shall be governed by all of the provisions of the aforementioned Contract Documents and all other Contract Documents of which in any way affect the work herein specified.

1.02 WORK INCLUDED:

- A. Examine all drawings and specifications, including the General Provisions and Special Conditions which are a part of this Contract.
- B. All labor, materials, equipment transportation, construction plant and facilities necessary for the proper execution and completion of the work as defined and required by the Contract Documents. Also, all work not specifically included in the Contract Documents which is reasonably and properly inferable there from or accepted trade practice necessary for the proper completion of this work.
- C. The electrical scope of work shall include, but is not limited to the following major components, products and complete operable systems:
 - Electric distribution system including feeders, panelboards, transformers, disconnects, etc.
 - Grounding systems.
 - Branch circuit conduit and wire.
 - Underground boring
 - Electrical system seismic protection.

1.03 REFERENCES:

- A. The Contract and Agreement, instructions to bidders and all other general requirements of these specifications shall be considered a components part of this Division of the specifications.

- B. The Contractor shall be governed by all of the aforementioned Contract Documents and all other Contract Documents of which in any way affect the work herein specified.

1.04 ELECTRIC SERVICE:

- A. The electric service as existing at Morgan Woods Park is 480 volts, 3 phase, 4 wire.
- B. The electric service as existing at Johnson Road Park is 120/240 volts, 1 phase, 3 wire.
- C. Schedule all power outages with MLG&W.
- D. Coordinate all service work with MLG&W and furnish all service materials and metering in accordance with their requirements.

1.05 PERMITS, CODE REQUIREMENTS AND FEES:

- A. All work shall conform to the rules and regulations of the latest edition of the National Electrical Code, including all subsequently published addenda thereto. Include all items of labor and materials required to meet such Code regulations regardless of the failure to mention in the in the specifications or show on the drawings each individual item.
- B. The work shall also conform to the latest established standards of the Institute of Electrical Electronic Engineers (IEEE), National Electric Manufacturer's Association (NEMA); and State, and local County electrical codes, and other authorities having jurisdiction.
- C. The foregoing standards shall be followed by the Contractor as minimum requirements. They shall not relieve the Contractor from furnishing and installing higher grades of materials and workmanship that may be specified herein or indicated on the drawings.
- D. Take out all necessary permits and pay all fees in connection with work under this Division.
- E. At the completion of the project, secure and turn over to Owner certificates of inspection, properly signed by the controlling building department which shall state that all rules have been complied with and that the work is approved as installed. Provide copies of certificates with operating and maintenance brochures. Acceptance by local building officials shall not relieve Contractor from furnishing materials specified in contract documents.

1.06 ACCURACY OF DATA, DRAWINGS AND INTERFERENCES:

- A. Electrical drawings are intended to indicate only the extent diagrammatically, general character and location of the work included. Work intended, but having minor details obviously omitted or not shown shall be furnished and installed complete to perform the functions intended.
- B. Examine carefully all contract drawings as well as the electrical drawings. Install equipment as nearly as possible to the locations and arrangements as indicated. Provide minor adjustments as necessary to coordinate the electrical work with the Architectural and Mechanical systems and to avoid all interferences therewith. All offsets, rises, pull boxes and fittings are not necessarily shown on the drawings; however, these shall be provided as required.
- C. All building dimensions, elevations, etc., shall be taken from site measurements.

1.07 RECORD AS-BUILT DRAWINGS:

- A. Upon completion of the project, deliver to the Architect, one set of reproducible "As-Built" vellums. As-Built drawings shall show the actual installation locations, depths, and sizes of all underground electrical work. Switchboard, panelboard and lighting fixture schedules shall be modified to indicate actual products and manufacturers installed. Drawings shall indicate all homerun locations and circuit groupings.
- B. Make field measurements of the installed locations of all underground electrical work as work progresses. Show all locations by dimensions from permanent readily identifiable reference points such as building walls, columns, curbs, drives, etc. Show all depths by dimensions below finished grade.

1.08 INSPECTION OF SITE:

- A. Prior to bidding work under this Division, visit the site of the proposed work and thoroughly observe conditions to be encountered. Failure to make such preliminary observation and inspection shall in no manner relieve the Contractor in the complete and proper execution of work described herein and/or as may be necessary to meet all requirements of the job.
- B. Refer to General Provisions for pre-bid meeting requirements that may affect bidding work for this project.

1.09 PRODUCTS:

- A. Materials and workmanship in the installation shall be of the best for the purpose intended and shall meet with the approval of the Architect. The Architect/Engineer reserves the right to reject any materials and workmanship not in accordance with

those specified or not meeting the Architect/Engineer approval, either before or after installation.

- B. All materials shall be new, with UL label where available. If UL label is not available, material shall be manufactured in accordance with applicable NEMA, IEEE and Federal Standards. Labeled products shall be utilized and installed per manufacturer's instructions so that labeling is not violated.

1.10 SUBMITTALS:

- A. Prior to ordering any equipment, the electrical contractor shall furnish for the Architect's approval submittal brochures. Submittals shall include the following:
- Panelboards with labels
 - Disconnect switches
 - Transformers
 - Seismic restraint products
 - Wire/cable
 - Boxes
 - Conduit systems, junction boxes and fittings
 - Exterior pull boxes
 - Expansion fittings
 - Fuses
 - Wire and cable connectors
- B. Submittals shall include Contractors name and telephone number, Distributors name and telephone number, Manufacturer's name and product, catalog cut-sheets complete with product descriptions, weights, dimensions and all applicable device ratings (volts, amps, watts, interrupting ratings, etc.)
- C. All equipment shall be submitted in an indexed bound hard ring back binder for the electrical division. All items shall be submitted at one time, partial submittals will not be considered.
- D. Resubmittal of products changing manufacturer after similar products have been submitted and approved will result in engineering charges for re-review of electrical

shop drawings. An engineering fee will be quoted and approved before any re-approval of drawings.

- E. Catalog cut-sheets including multiple products or multiple product options and accessories shall be clearly marked to indicate products and options being furnished. Failure to identify products will result in submittals being rejected.

1.11 OPERATING AND MAINTENANCE MANUALS:

- A. Three sets of approved submittal manuals shall be prepared as “Operating and Maintenance Manuals”. Operating and Maintenance Manuals shall include in addition to the submittal data, all equipment operating instruction books, parts list, wiring diagrams, product warranties and certifications.
- B. Manuals shall be bound and indexed. Covers shall be labeled with project name, data, Contractor, Architect and all responsible vendors.
- C. Provide detailed warranty information for all products furnished with extended warranties. This information shall include name of manufacturer, telephone number for in warranty repair and service and proof of purchase date. Products that may include extended warranty are lighting fixtures, electronic ballasts, battery operated emergency lights.

1.12 SAFETY DEVICES:

- A. Provide suitable guards when not furnished by manufacturer to enclose all wire connection, electrical contacts, etc. Guards shall be sheet metal or rigid electrical insulating material rigidly secured so as to be readily accessible and shall meet OSHA standards.
- B. Provide warning signs to caution people of possible dangers to high voltage and energized live parts, and or special operating procedures.

1.13 TEMPORARY UTILITIES:

- A. All temporary wiring for construction power shall conform to Article 590 of NEC and all applicable rules and regulations of OSHA.

1.14 PROTECTION OF WORK:

- A. The Contractor shall protect his work at all times from the danger of freezing, breakage, dirt, foreign materials, etc., and shall replace all work so damaged. Make every precaution to protect the work of others, and be responsible for all damage to other work.

1.15 STORAGE OF MATERIALS:

- A. Make provisions for the delivery and safe storage of all materials. Mark and store all materials in such a manner as to be easily checked and inspected. Make a complete and

careful check of all materials received and furnish a receipt acknowledging acceptance of the delivery and condition of the materials received. After such acceptance, assume full responsibility for the safe keeping of same until such a time as the completed installation has been approved and accepted.

1.16 DRILLING, CUTTING, AND PATCHING:

- A. Furnish all cutting, chipping, drilling, etc., as may be necessary for the proper installation of work. Care shall be taken in such cutting and chipping so as not to cause excessive repair work.
- B. All patching and repairing shall be by this contractor.

1.17 PAINTING:

- A. Provide a prime coat of paint for all supports, hangers, frames, etc., furnished and installed under this section of the specifications.
- B. Touch-up equipment finishes where factory finish is damaged.

1.18 IDENTIFICATION OF EQUIPMENT AND SYSTEMS:

- A. Identify all items of equipment and circuitry throughout project.
- B. Equipment shall be identified with engraved laminated plastic permanently attached by screws to apparatus. Identification nomenclature shall be same as that on Contract Drawings except where specifically requested otherwise by Owner.
- C. Each multipole circuit breaker or switch in power or distribution panelboards and switchboard shall have engraved nameplate of Micarta or similar materials. Contractor shall submit completed nameplate schedule for approval.

1.19 TESTING AND ADJUSTMENTS:

- A. Insulation Test: Prior to energizing equipment or circuits, all panelboard, and all feeder and branch circuit conductors, all motors, transformers, etc., shall be insulation tested with a direct current Megohm Meter similar to Biddle Co., "Megger".
- B. All wiring shall be so installed that when completed, the system will be free from short circuits and grounds except as allowed by Article 250 of National Electrical Code.
- C. Correct all short-circuit and unintentional grounds and all low reading circuits. Notify equipment suppliers of all questionable test results and remedy same as directed by equipment manufacturer.

- D. Check and adjust all equipment to operate smoothly, quietly and in accordance with manufacturer's installation, maintenance and start-up instructions.
- E. All auxiliary and cable systems shall be tested for proper operation. Owner's personnel shall be thoroughly familiarized with the proper operating procedures for each system.

1.20 OBSERVATION OF WORK AND DEMONSTRATION OF OPERATION:

- A. At final inspection, open panel and switchboard covers, junction box covers, pull boxes, device covers, and other equipment with removable plates for inspection. Provide sufficient personnel to expedite cover removal and placement.
- B. Contractor shall assist Manufacturer in demonstration and operation of new systems to satisfaction of Owner.

1.21 WORKMANSHIP, GUARANTEE (QUALITY ASSURANCE):

- A. Work under this Division shall be first class with emphasis on neatness and workmanship.
- B. Install work using competent mechanics, under supervision of foreman, all duly certified by local authorities. Installation is subject to Architect/Engineer periodic observation, final approval, and acceptance. All unsuitable work will be rejected!

1.22 EXCAVATION AND BACKFILL:

- A. Provide all necessary excavation and backfilling in connection with the electrical work.
- B. After raceways have been laid, tested and approved, carefully tamp backfill around raceways.
- C. Except where specifically noted on drawings all underground conduit systems shall be installed using directional boring. Conduits shall be bored a minimum of 24" below grade.

1.23 CLEAN-UP:

- A. Maintain premises free from accumulation of scrap material, shipping materials, etc., caused by work herein, so as to provide a safe and orderly work place.
- B. At completion of work, remove all surplus materials, tools, etc., and leave premises clear of construction debris. Clean all distribution equipment and remove all construction debris from panelboards, switchboards and similar equipment.

1.24 ALTERNATES:

- A. The Contractor is referred to the Bid Form for alternates that may affect pricing of work.

END OF THIS SECTION

DIVISION 16 – ELECTRICAL

SECTION 16050 – BASIC MATERIALS AND METHODS

PART 1 – GENERAL

1.01 REQUIREMENTS:

- A. The General Documents form a part of this section.
- B. Section 16010, Electrical General Provisions, shall be a part of this section.

1.02 WORK INCLUDED:

- A. Work included under this section shall consist of furnishing and installing raceway and wiring systems with associated junction and outlet boxes, devices and equipment as indicated on the drawings and described herein.

PART 2 – PRODUCTS

2.01 CONDUITS:

- A. Exposed conduit below 8 ft. AFF and all exposed exterior conduit except where noted differently on the contract drawings shall be galvanized rigid steel conduit of high grade, open hearth, welded steel pipe of standard weight, conforming to Federal Specifications WWC-581 ANSI, C80.1 and UL Standard #6. All other conduit shall be EMT, Electrical Metallic Tubing.
- B. The last 36” of conduit to motors and transformers and other vibrating equipment shall be liquid-tight, flexible electrical conduit with internal grounding conductor as sized by Code.
- C. All conduit shall be 3/4” minimum diameter.
- D. Where conduit is used in concrete slabs or underground applications, use Schedule 40 PVC rigid plastic conduit as manufactured by Carlon or approved equal.
- E. Couplings and connectors for all EMT conduit systems shall be set screw type of galvanized or sheardized steel (Die cast fittings, will not be acceptable.) Fittings shall be concrete tight.
- F. All rigid steel conduit fittings shall be threaded galvanized steel.
- G. Type MC or AC cable will not be an acceptable wiring method for this project.

2.02 WIRE AND CABLE:

- A. All feeders and branch circuit wiring shall be type THWN suitable for 75 degree C normal conductor operation and shall be rated 600 volts of not less than 12 gauge except where noted differently.
- B. All wire and cable shall be stranded, all conductor sizes.
- C. Wire and cable color coding shall be as follows:

PHASE	120/240 V	480Y/277
A	BLACK	BROWN
B	RED	ORANGE
C		YELLOW
NEUTRAL	WHITE	GRAY
GROUND	GREEN	GREEN

- D. Grounded conductors #6 and smaller shall be identified by a continuous white or natural gray outer finish. Conductors larger than #6 shall be continuous white color or by three bands of white tape on any color insulation other than green per Article 200-6 (a) and (b) of NEC.
- E. Grounded conductors of different systems shall have a white covering with readily distinguishable and different colored strip (not green) running along the insulation per Article 200-6 (d) of NEC.
- F. Use factory color coded wire for No. 12 and No. 10 gauge. Use two bands of color tape for No. 8 and larger conductors.
- G. All wire and cable furnished under this section shall be "Copper". No aluminum cable will be allowed.

2.03 WIREWAYS:

- A. Wireways or wiring troughs, if used to facilitate wiring, shall be Square "D" Hinge Cover Lay-in Duct or General Electric Type HW with necessary connections and fittings.
- B. Wireways installed outdoors shall be NEMA 3R rated.

2.04 PULL BOXES, OUTLET BOXES AND FITTINGS:

- A. Pull boxes or junction boxes, where shown on the drawings or where required to facilitate pulling of wires or cables, shall be of proper size and shape as required by Section 370 of NEC. Large pull boxes and junction boxes shall be 12 gauge steel, with 2 coats of shop applied light gray rustproof enamel paint over phosphatized

- primer. Covers shall be of the same gauge as the boxes, and secured to boxes with proper number of screws.
- B. All metallic conduit fittings shall be galvanized or cadmium plated, adapted to type of conduit system installed. All plastic fittings shall be Schedule 40 of the same manufacturer as conduit. Fittings shall meet all requirements for the Underwriter's Laboratories, Inc., and the National Electrical Code.
 - C. Each switch, light, receptacle, and other miscellaneous device shall be provided with an outlet box.
 - D. Boxes shall have only the holes necessary to accommodate the conduit at point of installation. All boxes shall have ears to secure covers.
 - E. All boxes shall be rigidly secured in position. Boxes installed outdoors shall be NEMA 3R rated.

PART 3– EXECUTION

3.01 GENERAL:

- A. All the conductors in this installation shall be run in conduits. Equipment and devices installed by the Contractor and not constructed with enclosures especially suited for mounting and enclosing all live parts shall be installed in metal cabinets furnished by the Contractor. It is intended that complete raceways or enclosures be provided for all circuiting throughout the extent of all the systems specified.
- B. All conduit shall be reamed after threads are cut. All ends shall be cut square and shall butt solidly into couplings.
- C. All exposed conduit shall run parallel to walls in the most direct manner and shall be securely attached with Minerallac conduit mounting straps. When anchoring straps to masonry surfaces, use metal expansion anchors or Phillips steel inserts or approved equal. Metallic conduits exposed to damp or wet locations shall have a 1/4" air space between conduit and supporting surface. Use a 1 hole galvanized conduit strap and clamp back or approved equals. Horizontal runs shall be run with slight incline without forming low spots, in order that they may drain properly.
- D. Conduits shall be run with smooth, easy bends. They shall be held in boxes with locknuts and shall have bushings for protection of the wires.
- E. Additional pull boxes, junction boxes, or conduits, where required to facilitate pulling of wires, shall be of the proper size and shape for the conduits and wires entering them.

- F. Where conduits enter switchboards and service equipment, locknuts and grounding bushings shall be provided. Bushings shall be insulated where the wires are 6 gauge or larger. Grounding bushings will be required on feeder conduits to all panelboards and transformers. Branch circuit conduits feeding isolated ground outlets shall also have grounding bushing.
- G. All conduit openings shall be temporarily plugged to exclude water, concrete and other foreign substances during construction. All conduits shall be cleaned before the wires are installed.
- H. A lubricating compound such as Ideal Yellow 77, or approved equal may be used to facilitate wire pulling.
- I. Carefully lay out all outlets and coordinate with other trades so that the outlets are not blocked, hidden or inaccessible for use or maintenance.
- J. Lighting and receptacle wiring circuits shall be installed in accordance with the layout shown on the drawings and shall be divided and balanced to 5 percent about the neutral in branch circuit panels.
- K. Branch circuit wire sizes shall be as noted on drawings. Where wire sizes are not shown wiring shall be as follows:

20 Amp 120 Volt Branch Circuits	
Distance from panel to 1 st device	60 Ft use #12
Distance from panel to 1 st device	61 Ft to 120 Ft use #10
Distance from panel to 1 st device	121 Ft to 160 Ft use #8
20 Amp 277 Volt Branch Circuits	
Distance from panel to 1 st device	140 Ft use #12
Distance from panel to 1 st device	141 Ft to 250 Ft use #10
Distance from panel to 1 st device	251 Ft to 350 Ft use #8

- L. Grouping of homeruns shall be limited to what is shown on drawings.

3.02 ELECTRICAL SUPPORTING DEVICES:

- A. Furnish and install all necessary hangers, supports, fasteners, platforms, frames and all other similar construction materials necessary for the proper and safe support of all conduit and equipment furnished under this Division of the Specifications.
- B. Supports for lighting fixtures, panelboards, exposed feeders, etc., shall be UL listed. See seismic specifications for additional support requirements.

- C. Conduit shall be securely supported, strapped, or otherwise attached to the building structure in an approved manner. Conduit shall be firmly fastened within 3 feet of each outlet box, junction box, cabinet or fitting. Conduit shall be supported at intervals not to exceed those specified in Chapter 3 of National Electric Code.

3.03 WIRE AND CABLE CONNECTIONS:

- A. Branch circuit wiring 10 gauge and smaller installed indoors shall be terminated with solderless, screw-on pressure type terminators and insulators similar to Ideal wirenuts. Connectors shall be UL listed and color coded for wire sizes and quantities involved.
- B. Terminations to electrical equipment, i.e. circuit breakers, switches, panelboard busses etc., shall be made with a suitable hex or screw head box lug as provided by the equipment manufacturer. When no suitable box type lug is provided the Contractor shall finish and install a box type lug similar to T&B Reddy Lug, or Burndy Universal terminal type KA or K2.
- C. Set screw pressure connectors shall be tightened to the manufacturer torque values included in the instructions listing or labeling. When such valves are not available, the torque values listed in NEC 99 tables 1.3 through 1.6 shall be used as a guide.
- D. Terminations requiring a bolted connection to NEMA type blades or pads shall be made with a Crimp Joint connector. The connector shall be a one piece tubular construction made of pure electrolytic copper, tin plated for corrosion resistance. The connector shall be so designed that indents may be made on any portion of the barrel circumference. Terminations shall be type YAV for #8 AWG, Type YA-1 for #6 through 4/0 AWG, Type YA for 250 MCM and larger or approved equal. Indents shall be made with a hydraulic compression tool designed to lock the connector into the tool until a complete positive connection has been made. Terminations shall be Burndy HYLUG or approved equal.
- E. Butt type terminations for wire #8 gauge and larger shall be made with inline compression connectors and thick wall heat shrink insulation. Splices shall be similar to Burndy Insulated HILINK or approved equal.
- F. Splices shall not be made in below grade pull boxes. All conductors shall be installed in continuous lengths from lighting control panels to light pole ballast enclosures.

END OF THIS SECTION

DIVISION 16 – ELECTRICAL
SECTION 16170 – GROUNDING AND BONDING
PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED:

- A. Section 16010, General Provisions and Section 16050, Basic Materials and Methods shall be a part of this section.

1.02 WORK INCLUDED:

- A. Work required under this section consists of grounding and bonding of electrical service, and equipment.

1.03 REFERENCES:

- A. All grounding and bonding shall be installed per Article 250 of the National Electric Code (NEC).

PART 2 – PRODUCTS

2.01 GROUND RODS:

- A. Ground rods shall be 3/4" by 10 ft solid copper. Where additional ground rod length is required, rods shall have threaded ends and couplings.

2.02 GROUND CONNECTIONS:

- A. Ground connections shall be compression type or exothermic welded. Connections shall be UL467 listed and meet all IEEE 837 requirements. Connections below grade shall be listed for direct burial.
- B. Compression connections shall be irreversible type as manufactured by Burndy or approved equal. Compression tool shall be hydraulic type that can not be opened until a complete compression has been made. Compression tool die shall permanently label the connector with die type and number.

PART 3 – EXECUTION

3.01 GROUNDING:

- A. The Utility service and each separately derived electric system (step down transformers and generator) shall be grounded in accordance with Article 250 of National Electric Code and all local code requirements.
- B. The service grounding electrode system as required by Article 250-50 of National Electric
- C. Grounding of separately derived systems shall be made to the nearest effectively grounded building steel column or metallic water pipe.

3.02 BONDING:

- A. Provide bonding for all electrical equipment enclosures, raceways, boxes and similar equipment according to Article 250-80 through 250-106 of the 1999 National Electric Code (NEC).
- B. Provide grounding bushing on all metallic conduits and equipment enclosures ahead of service disconnect.
- C. Bond all interior metal piping systems to grounding electrode system.
- D. Bond building steel structures that are supported by masonry or similar non-metallic walls to the grounding electrode system per Article 250-104 of NEC.
- E. Grounding and bonding conductors shall be protected from physical damage with conduit. Use PVC conduit where allowed by Code for protection. Where metallic conduit is used, provide full size bonding conductors at each end of conduit as required by Code.
- F. All ground connections shall have clean contact surfaces and shall be made with approved fittings.
- G. Show all buried or concealed ground bonds on As-Built plans

3.03 EQUIPMENT GROUNDING:

- A. All circuits shall have insulated green grounding conductor sized per Article 250 of the NEC.
- B. All flexible wiring systems shall be furnished with an internal insulated green grounding conductor.
- C. Ground connections to painted or similar coated metals shall have all paint or coating removed between connector and metal. Use hex head machine bolts and nuts with flat and split ring lock washer or lug. Stove bolts are not acceptable.
- D. Provide grounding bushing for all circuits over 240 volts, and over 100 amps, all conduits entering eccentric or concentric knockouts, all conduits entering plastic or non-metallic enclosures, and all circuits serving isolated ground receptacles.
- E. Equipment grounding conductors in branch circuits, feeders and service conduits shall be bonded together and to the metallic enclosures of all junction and pull boxes. This bonding shall include all switches and outlet boxes.
- F. Sheet metal screws, Tec screws, and equipment mounting bolts shall not be used for grounding or bonding. All grounding screws shall be green and shall be UL listed for equipment grounding.

END OF THIS SECTION

DIVISION 16 - ELECTRICAL
SECTION 16190 - SEISMIC RESTRAINT SYSTEMS
PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Section 16010, General Provisions and Section 16050, Basic Materials and Methods shall be a part of this section.

1.02 WORK INCLUDED

- A. Work required under this section consists of furnishing and installing seismic restraint systems.

1.03 GENERAL

- A. All electrical equipment shall be seismically protected per Standard Building Code (SBC) 1999 Edition, Section 1607. Seismic isolation shall be provided utilizing snubbers and/or neoprene mounting brackets with captive steel inserts.
- B. Equipment shall be protected per Seismic Hazard Exposure Group Table 1607.1.6, Seismic Performance Category Table 1607.1.8 or as amended by local codes. Seismic coefficient and performance criteria factor table 1607.6.4A.
- C. All isolators and isolation materials shall be of the same manufacture and shall be selected and certified using published or factory certified data.
- D. All equipment requiring seismic restraint must include verifying calculations and analysis performed by a licensed professional engineer in the State of Tennessee. Products shall be of similar to those furnished by Mason Industries, Inc. as represented by Gorham/Shaffler in Memphis, TN, telephone number (901) 345-6100. All seismic restraint products and calculations shall be obtained by and paid for by the contractor and submitted for review prior to beginning work.

PART 2 - PRODUCTS

2.01 PROTECTION DEVICES

- A. Devices shall be of manufacturer's latest design as required for equipment to be protected and shall include installation instructions.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Except as otherwise indicated, seismic restraint shall comply with manufacturer's instructions for the installation and load application.

3.02 ELECTRICAL EQUIPMENT REQUIRING SEISMIC ISOLATION

- A. Furnish and install seismic isolation on all electrical equipment, conduit and lighting fixtures as required in SBC Table 1607.6.4A.
- B. Furnish seismic protection for the following equipment:
 - All distribution equipment
 - Conduit systems per Note #2 of SBC Table 1607.6.4A

3.03 SEISMIC SUPPORT SUBMITTALS

- A. Submittals including calculations and installation methods and products shall be kept on job site for reviewing by local inspectors.

END OF THIS SECTION

DIVISION 16 – ELECTRICAL

SECTION 16400 - SERVICE AND DISTRIBUTION

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Section 16010, Electrical - General Provisions, Section 16050, Basic Materials and Methods, shall be a part of this section.

1.02 WORK INCLUDED

- A. Work to be provided shall include furnishing and installing switchboards, panelboards, disconnects, and associated distribution equipment.

PART 2 - PRODUCTS

2.01 PREFABRICATED LIGHTING AND OUTLET PANELBOARDS

- A. Furnish and install Square "D", Siemens, GE or Cutler Hammer panelboards of the size and type scheduled on the drawings. Panelboards shall be designed for 208Y/120 volt, 3 phase, 4 wire, 480Y/277 volt, 3 phase, 4 wire or 480 volt 3 phase, 3 wire service as scheduled on drawings.
- B. All panelboards shall be furnished complete with full height locking door with padlock hasp and interior dead front trim. Panel front shall be hinged to panel can. Multi section panels shall be furnished with identical size cans for all sections.
- C. All panelboards shall be fully rated for interrupting rating listed on drawings. Series rated interrupting rating will not be acceptable except for protection of motorized "Powerlink AS" control circuit breakers where specifically noted on drawings.
- D. Panelboard circuit breakers shall bolt to panel bus and shall be of the quantity and rating listed on drawings. All circuit breakers shall be UL listed for 75 degree C. wiring systems.
- E. All panelboards shall be furnished with copper bus including neutral and ground bus. Provide oversized neutral and isolated ground busses as noted on drawings.
- F. Provide "On- Position" handle locks on all circuit breakers serving fire alarm panels and battery operated emergency lighting circuits.
- G. Panelboards shall be furnished with engraved nameplates indicating type of service, i.e. (Black with white lettering for normal service, red with white lettering for emergency service). Nameplates shall be attached to panel trim with screws. Nameplates shall indicate panelboard name, voltage, phase, and minimum interrupting rating as shipped from factory.
- H. Provide arc flash protection warning signs in accordance with NEC 110.16.
- I. Panelboards shall be provided with typewritten circuit directories. Directories shall indicate room number and load served by each circuit. Room numbers shall match

room numbering

system installed by Owner, not room numbers indicated on drawings. Panels shall have permanent readily visible numbers for all breakers and spaces.

- J. Circuit breakers shall be installed in panels in locations shown on panel schedules. In addition to typewritten circuit directory listed above, install copy of the drawing panel schedule in a clear pocket inside each panelboard door.

K.

2.02 SAFETY SWITCHES

- A. Safety switches shall be heavy duty, NEMA type "HD" fusible or nonfusible as indicated. Switch mechanism shall be quick-make, quick-break. Cover shall be interlocked with mechanism to prevent opening unless switch is on the "OFF" position. Switches mounted outdoors shall have NEMA 3R enclosures. All switches shall be furnished with rejection type fuse clips for Class RK fuses, ground lug and engraved Micarta nameplates. Switches shall be Square "D" or approved equal.

2.03 DRY TYPE TRANSFORMERS

- A. Transformers shall be ventilated dry type with Class H insulation. Transformer shall be rated 480 volt to 208Y/120 volts, 3 phase, 4 wire as indicated on drawings. Transformer KVA ratings shall be as detailed on drawings. Transformers 15 KVA and larger shall be furnished with taps two (2) 2-1/2% F.C.A.B. and four (4) 2-1/2% F.C.B.N.
- B. Transformers shall be mounted on vibration isolators. Conduit connections to transformers shall be made with neoprene jacketed flexible conduit.
- C. Transformers shall be compliant with NEMA TP-1 energy efficiency requirements per EPA Act 2005/CFR 10 Part 431.
- D. Where transformers are floor/slab mounted, they shall be set on 4" high concrete pads.
- E. Secondary neutrals of all transformers shall be grounded per Article #250 of NEC. Grounding electrode conductor shall be installed in conduit for its entire length.
- F. Transformers shall be as manufactured by Square "D", GE, Siemens, Cutler Hammer or approved equal.

2.04 MARKING TAPE

- A. All underground ductlines conduits, ground conductors etc. shall be marked with marking tape inserted in trench 24 inches above top of ductline and a minimum of 12 inches below grade. Tape shall be as manufactured by Allen Systems, Inc. or approved equal labeled "Caution - Buried Electric Lines Below".

2.05 VARIABLE DEPTH PULL BOXES

- A. Furnish and install where indicated on drawings, variable depth pull boxes. Pull boxes shall be furnished with locking steel cover with logo "ELECTRIC" or "COMMUNICATIONS" as required. Boxes shall be Quazite PG series polymer concrete reinforced with heavy-weave fiberglass or approved equal. See drawings for catalog numbers.
- B. Boxes shall be provided with extensions for depth to top of ductline. Top of box shall be set flush with finished grade. The pullbox shall be set to finished surface elevation on a prepared limestone base with a minimum depth of 8 inches. The surrounding backfill materials shall be placed prior to settling the upper frame. A concrete collar shall be formed around top of box per drawing details.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Switchgear shall be installed as per switchgear manufacturer's recommendations and as required by the National Electrical Code. All equipment shall be positioned to maintain proper working clearances as required by Article 110 of NEC.
- B. Internal parts of electrical equipment, including bus bars, wiring terminals, insulators and other surfaces, shall not be damaged or contaminated by foreign materials such as paint, plaster, cleaners or corrosive residues.

3.02 EQUIPMENT SUPPORT

- A. All electrical equipment shall be properly attached to building structure with seismically designed attachment as detailed in specification Section 16190.

3.03 EXISTING DISTRIBUTION EQUIPMENT MODIFICATIONS

- A. Add circuit breakers in existing panelboards as indicated and as required matching manufacturer, frame and AIC ratings. Breakers shall be of the same type presently installed in equipment. Modifications shall be made as directed by equipment manufacturer.
- B. All panelboards modified by new construction shall be put in like new condition. All bolted connections shall be tightened on cable lugs and buss work.
- C. Modify existing building power panels, gutters, and panelboards where noted on the drawings and as required. All modifications and additions to equipment shall be performed in accordance with manufacturer's directives.

- D. Modify existing feeder system as indicated on the drawings.
- E. Furnish and install new panelboard labels, indicating panel designation with voltage and phase.

END OF THIS SECTION